

FOCUS

Communicating NCID's prevention and control programs for emerging and reemerging infectious diseases

Message from the Director

Dear Colleagues:

NCID participates in several CDC training programs for public health professionals and has instituted new programs with partners and organizations in support of one of the goals of CDC's emerging infections strategy—human resource development.

The Emerging Infectious Diseases (EID) Laboratory Fellowship program is a partnership between CDC and the Association of Public Health Laboratories (APHL), designed to train individuals for careers in public health laboratory science. The program offers a 1-year training fellowship for persons with bachelor's or master's degrees (emphasizing the practical application of technologies, methods, and practices related to emerging infectious diseases) and a 2-year research fellowship for doctoral level scientists (emphasizing infectious disease research). Since the program began in 1996, 73 fellows have been assigned to CDC or state public health laboratories. In 1998, an international component was added through an educational grant from Eli Lilly and Company, in collaboration with the National Foundation for CDC.

NCID provides training in field epidemiology to 20-25 members of the Epidemic Intelligence Service (EIS) each year, and is expecting its fourth Prevention Effectiveness Fellow (all Ph.D. economists) since that program began 4 years ago. We also look forward to recruiting CDC Informatics Fellows. NCID currently has five Association of Schools of Public Health Fellows, two Association of Teachers of Preventive Medicine Career Development Awardees, and 17 American Society for Microbiology Fellows.

Additional training programs offered by NCID will be featured in future issues of *Focus*.

James M. / Suglies James M. Hughes, M.D.

Focus on Hospital Infections

HIP collaboration targets hospital infections, antimicrobial resistance among children

he Hospital Infections Program (HIP) and the National Association of Children's Hospitals and Related Institutions (NACHRI) have completed phase one of the first national effort to address issues related to the prevention and control of hospital infections and antimicrobial use in pediatric patients. More than 50 NACHRI hospitals are participating in the 3-year study.

NACHRI is an association of children's hospitals, large pediatric units of medical centers, and related organizations in the United States and Canada. HIP's efforts in this collaborative project are being coordinated by William Jarvis, Denise Garrett, and Farah Parvez.

In the first year, a survey was conducted to assess the current surveillance methods, infection control practices, antimicrobial usage patterns, and antimicrobial resistance rates at 56 children's hospitals. Findings from this survey provided information about the practices among children's hospitals. These results are being used as the basis for additional studies and activities aimed at determining the best practices and benchmarks for providers in this setting.

Two studies based on the survey data were presented at the Infectious Disease Society of America annual meeting in November 1998: 1) a study of infectious disease outbreaks and exposures investi-



Pediatric surgeon Charles Stolar communicates with a patient at Babies and Children's Hospital at Columbia-Presbyterian Medical Center, New York City, which is a member of NACHRI.

gated in children's hospitals and 2) a study of infection rates and surveillance practices in neonatal intensive care units and pediatric intensive care units. A second survey is now being conducted to assess the pharmacy capabilities of children's hospitals and their use of various antimicrobial agents and the relationship between antimicrobial use and the emergence of antimicrobial resistance. Results from this survey will be used to design multisite studies regarding the use and appropriateness of use for targeted antimicrobials.

Several projects have been designed and planned for year 2, including

1) a survey to assess rates of vancomycin use and determine the clinical settings in which vancomycin is administered to pediatric patients (this survey will provide data to assist CDC in developing guidelines for appropriate use of vancomycin in pediatric settings);

2) a survey to estimate the prevalence of hospital infections in intensive care unit patients at U.S. children's hospitals and to assess the impact of these infections by measuring prolongation of hospital stay and cost; and

3) a survey to gather information on antimicrobial use and antimicrobial resistance among patients at U.S. children's hospitals.

These data will help national public health authorities develop guidelines on antimicrobial therapy recommended for children and implement appropriate infection control interventions. ■

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NCID Summer Research Fellows Program

t was a very good summer for the 1998 NCID Summer Research ■ Fellowship Program. The program, now 10 years old, has helped train 179 students. It was begun with students from Morehouse School of Medicine and Tuskegee University School of Veterinary Medicine with the goal of providing educational and laboratory experience for minority and disadvantaged students in the medical sciences and public health. The program has rapidly expanded, and its alumni now come mainly from the nine academic institutions that are members of the Minority Health Professions Foundation. Most of the program's graduates have completed (or are pursuing) degrees in medicine, veterinary medicine, pharmacology, or public health.

This year's participants came from as far away as Puerto Rico, New Mexico, and California and from Indiana to Texas. From 92 applicants, 26 were selected (mean grade point average, 3.5): 21 are African Americans, three are Hispanic, and two are Native Americans. Each was assigned a mentor in NCID laboratories.

The projects that students selected included the following: molecular diagnostic techniques for Campylobacter jejuni, Plasmodium falciparum, sexually transmitted pathogens, and invasive filamentous



Ramat Arogundade, of Howard University College of Medicine, trying on a biohazard containment suit.



Howard University medical student Tamra Mckenzie runs an enzyme immunoassay for detecting fungi in the mycology laboratory.

fungi; epidemiologic studies of Yersinia pestis, Pneumocystis carinii, and St. Louis encephalitis virus; drug susceptibility studies; pathology of schistosomiasis; insecticide control of mosquito vectors; and health education regarding vaccination and infectious diseases.

Three projects —"The etiologic diagnosis of syphilis, Herpes simplex virus, and chancroid in South African miners, using multiplex polymerase chain reaction (M-PCR)" by Kia Williams, "Development and evaluation of a genotypic assay to measure in vitro effects of the antituberculosis drug pyrazinamide against Mycobacterium tuberculosis" by Celeste Newsom, and "Immuno-magnetic-bead separation and nested PCR for detection of Helicobacter pylori in water samples" by Tomekia Strickland—were selected for presentation at the Minority Trainee Research Forum in San Diego, California, November 2-6, 1998. Kia's mentor was Chen Yen Chen, Division of AIDS, Sexually Transmitted Diseases, and TB Laboratory Research (DASTLR), NCID; Tomekia's mentor was Alan J. Parkinson, Arctic Investigations Program, NCID; and Celeste's mentor was Robert Cooksey, DASTLR, NCID.

The responses of students and mentors have been equally enthusiastic.

Eleven of the participants will be pursuing careers in medicine; eight in pharmacology, five in veterinary medicine, and two in public health.

Congenital toxoplasmosis prevention initiatives begun

ast Fall, the Division of Parasitic Diseases (DPD) convened a national workshop on preventing congenital toxoplasmosis (CT) in the United States. Some 35 experts participated, including representatives from maternal and newborn toxoplasmosis screening programs in Europe, and U.S. experts from universities, practitioner associations (for example, the American Academy of Pediatrics, the American College of Obstetrics and Gynecology, the Council of State and Territorial Epidemiologists [CSTE]), research institutes, medical centers. and other federal agencies. Goals of the workshop included exploring existing ways to prevent CT, identifying gaps in knowledge of CT, and defining DPD's role in toxoplasmosis control.

Screening of pregnant women for infection with *Toxoplasma* is not mandatory in the United States, so CT prevalence figures are vague. Extrapolation from incidence data from Massachusetts indicates a U.S. prevalence of at least 400 cases of CT per year.

Toxoplasmosis is dangerous in pregnant women if they acquire their first infection several months before or during pregnancy. Infection can be passed on to the fetus, resulting in serious birth defects such as

What Is Toxoplasmosis?

Toxoplasmosis is a zoonotic disease (transmitted from animals to humans). Cats are the definitive host of the parasite *Toxoplasma gondii*. Intermediate hosts include rodents, pigs, sheep, cattle, and goats. The disease is usually transmitted by handling; by ingesting oocysts excreted in cat feces; or by consuming raw or undercooked pork, lamb, or venison. Toxoplasmosis can be prevented by handling and cooking meats correctly and by properly disposing of cat feces.

vision and hearing loss, mental retardation, severe illness, or even death.

Through serologic testing of women at risk of infection, diagnosis can be made and treatment begun. Early treatment of women infected during pregnancy can reduce the risk of transmission to

the fetus. If the fetus has been infected, treatment can reduce the severity of fetal illness.

Denmark, France, and Austria have ongoing comprehensive CT control programs. Representatives from those programs shared their knowledge and experience at the workshop. Screening newborns for CT, followed by appropriate treatment, has been advocated as an alternative or adjunct to screening pregnant women. The New England Newborn Screening Program in Massachusetts and New Hampshire, begun in 1986, is the only newborn CT screening program in the United States.

Since the workshop, CDC has begun to participate in new efforts to reduce the burden of toxoplasmosis in this country. An expert working group on newborn and maternal screening has been formed, with representatives from the American Academy of Pediatrics, the American College of Obstetrics and Gynecology, the New England Newborn Screening Program, the Danish Newborn Screening Program, DPD, and CSTE. With funds from CDC's Food Safety Initiative, DPD will hire a prevention-effectiveness fellow to conduct a cost-benefit study of the New England Newborn Screening Program to determine if newborn screening is a viable tool for CT



Experts from Europe and the United States gathered to discuss DPD's role in U.S. congenital toxoplasmosis control. From left, Jim McAuley, Vance Dietz, Tom Navin, Marianna Wilson, and Jack Remington. Phillipe Thulliez is in the foreground.

control. In addition, DPD will work with the American College of Obstetrics and Gynecology to conduct a survey of knowledge, attitudes, and practices of obstetricians and gynecologists regarding screening for toxoplasmosis.

DPD also plans to explore working with state and local health departments in the design and implementation of several health education interventions, including those targeted at women of child-bearing age, pregnant women, and veterinarians.

Organizers of the national CT workshop were DPD's Vance Dietz and Marianna Wilson. Tom Navin (DPD), Jim McAuley (CDC, Chicago Department of Health), and Jack Remington, Palo Alto Research Institute, served as moderators. DPD presenters included Dennis Juranek and Peter Schantz. Other speakers were Martin Meltzer, NCID, OD; J.P. Dubey, U.S. Department of Agriculture; Ruth Gilbert, Institute of Child Health, London; Phillipe Thulliez, Institut de Puericulture, Paris; Horst Aspock, Clinical Institute of Hygiene, Vienna; Eskild Petersen, Statens Serum Institute, Copenhagen; and Roger Eaton, University of Massachusetts Medical School.

NCID coordinates bioterrorism preparedness and response efforts

ecent domestic and international events have high-✓ lighted U.S. vulnerability to a terrorist attack with biological weapons. In response, Congress has authorized CDC to coordinate the effort to upgrade national public health capability to counter bioterrorism. CDC will take the lead in improving national, state, and local preparedness and epidemiologic and laboratory capabilities to detect these agents and respond rapidly to bioterrorism incidents. CDC will also oversee administration of the Select Agent Rule, which regulates the transport of restricted biologic agents, and creation of a vaccine and drug stockpile.

The need for these efforts is recognized in NCID's new plan, Preventing Emerging Infectious Diseases: A Strategy for the 21st Century, which specifically calls for development of new approaches to recognizing rare events and enhancing the nation's capacity to respond to infectious threats, including bioterrorism. Following this mandate, planners recognized the need for strong and extensive collaboration, not only within CDC but also with international, state, and local health agencies as well as with nontraditional public health partners, such as military and law enforcement organizations.

A workshop on August 25-26, 1998, coordinated by Bradley Perkins, Division of Bacterial and Mycotic Diseases, helped set the stage for NCID's efforts in responding to bioterrorism. Recommendations from this workshop focused on the development of a public health plan for response to bioterrorism and educational materials for media and the public about high-priority bioterrorism agents.

A second partnership meeting on December 8-9, 1998, moderated by Stephen Ostroff, NCID associate director for epidemiologic science, solicited more specific advice on developing surveillance networks and epidemiology, laboratory, and communications capacity to counter bioterrorist threats. Kathy Cahill, director of the CDC



Office of Planning and Evaluation, discussed CDC's new bioterrorism budget initiative, which received approximately \$121 million in fiscal year 1999 for activities in four areas: planning, Health Alert Network (HAN), response, and stockpile. Through cooperative agreements with states, the HAN will be a nationwide system to provide information, electronic linkages, and resources for improving organizational competence and capacity when responding to bioterrorist acts.

Recommendations from this meeting included developing state-level core capacity for surveillance and epidemiology, state and local emergency response plans, and a national laboratory network for agents of bioterrorism.

NCID has strengthened its effort against bioterrorism by establishing the Bioterrorism Preparedness and Response Activity in the Office of the Director. The group is headed by Scott Lillibridge, with Karen White, deputy director for management and operations, Ali Khan, deputy director for epidemiology and surveillance, and Stephen Morse, deputy director for laboratory services. This new office will coordinate the activities proposed in last year's meetings and will be a focal point for efforts to improve bioterrorism-related expertise, facilities, and procedures at the local, state, and national levels. ■

IDEA Place

NCID receives 7 health communication awards

CID's work in health communication was re-warded recently by the CDC Communicators Roundtable. Each year, the Roundtable recognizes health communication staff in CDC for their work in supporting communication programs for public and professional audiences. Awards are given for products in print, electronic, and computer-based formats. Two overall "Excellence in Health Communication" awards are also presented.

Of the 16 Roundtable awards given in 1998, NCID received seven. Five of the nine divisions/programs received recognition for one or more communication products. The products were from both domestic and international projects, and were created internally by staff teams and with external partners.

Print media (fewer than 16 pages): Honorable mentions: DPD/Kenya Field Station — Asembo Bednet Project Calendar; and HIP—"Information for Health-Care Workers: Occupational Exposure to HIV"; Winner: DBMD — "Good News — A Cure for Ulcers!" (brochures in English and Spanish).

<u>Computer-based communica-tions:</u> Winner: DVRD — "All About Hantavirus" web page

Electronic media: Winners: DVRD — "Removal of Brain for Rabies Diagnosis" video; and AIP — "The YK Delta RSV Study: A Report to the People" video.

Excellence in Health Communication: Winner: DBMD — CDC
H. pylori Communication Team.

Congratulations to all the winners!

Cheryl Lackey Office of Health Communication, NCID

Workshop explores risk for transfusion-related spread of tickborne illnesses

ore than 100 representatives from government, the military, and private institutions participated in a workshop on the potential for transfusiontransmission of tickborne agents in Atlanta on January 14-15, 1999. The workshop, cosponsored by CDC, the Food and Drug Administration (FDA), the National Institutes of Health (NIH), and the Department of Defense, was held to review current information on tickborne pathogens and consider strategies for reducing the risk, if any, of transfusion-associated infections that may be caused by tickborne agents. The workshop was organized by an interagency working group led by Mary Chamberland, assistant director for blood safety, Division of Viral and Rickettsial Diseases, and James Childs, acting chief, Viral and Rickettsial Zoonoses Branch.

According to Dr. Chamberland, the meeting was an outgrowth of an investigation of tickborne illnesses diagnosed among National Guard members who had attended 2-week field training exercises at Fort Chaffee, Arkansas, during the summer of 1997: several of the ill Guard members had donated blood a few days before onset of their symptoms. These reports prompted a voluntary recall of blood products donated by guardsmen at the military base and a multiagency investigation to determine if recipients of transfused blood had developed an illness that could be traced to the infected donors. No cases of transfusion-transmitted illness were identified; however, the possibility of transfusion-associated infection could not be ruled out in all instances, and the potential for transmission of tickborne pathogens through the blood supply was recognized as an ongoing public health concern.

In an effort to assess this potential risk, the workshop focused on



A panel of medical experts addresses questions raised during the workshop on the potential for transfusion-transmission of tickborne agents. Panelists (L-R) included Laurence Corash, Cerus Corporation; Alfred DeMaria, Assistant Commissioner of Public Health, Massachusetts; Celso Bianco, New York Blood Center; Edward Tabor, FDA; Peter Krause, University of Connecticut School of Medicine; Edward Snyder, Yale-New Haven Hospital; Durland Fish, Yale School of Medicine; Joe McDade, NCID; and Jay Epstein, FDA.

five tickborne pathogens and their associated illnesses: *Rickettsia rickettsii* (Rocky Mountain spotted fever); *Borrelia burgdorferi* (Lyme disease), *Babesia microti* (babesiosis), *Ehrlichia chaffeensis* (human monocytic ehrlichiosis), and the unnamed agent of human granulocytic ehrlichiosis.

The pathogens are transmitted to humans by the bite on an infected tick. Each of these agents causes a febrile illness with nonspecific symptoms; the incubation period ranges from a few days to 4 weeks. The diseases are readily treatable with antibiotics, but can be difficult to diagnose on the basis of clinical signs and symptoms alone.

Data presented during the workshop showed that transfusion-transmission has been documented in fewer than 30 cases of babesiosis, one case of Rocky Mountain spotted fever, and no cases of Lyme disease or ehrlichiosis.

According to Roger Dodd, head of the Transmissible Diseases Department, American Red Cross Holland Laboratory, current information suggests that the risk for transfusion-transmission is low for *Babesia microti* and largely theoretical for other tickborne pathogens. Given this level of apparent risk, Dr. Dodd questioned whether it is prudent to consider new blood-safety interven-

tions, such as testing of blood donors. Currently, there are no approved tests to screen donated blood for these agents.

At the conclusion of the meeting, a panel consisting of representatives from CDC, FDA, NIH, the Council of State and Territorial Epidemiologists, blood collection centers, and universities addressed some of the key issues raised during the workshop's scientific presentations. The panelists agreed that additional screening of the blood supply would likely not further reduce the risk for transfusion-transmission of these tickborne agents. The panel also cited the need for additional data on the epidemiologic and biologic features of these agents, more sensitive diagnostic assays, better surveillance of transfusion-transmitted infections, and improved physician education.

Focus on Arctic Investigations Program

Study examines link between antibiotic use and resistant Streptococcus pneumoniae in Alaska

he Arctic Investigations Program (AIP) and the Division of Bacterial and Mycotic Diseases are examining the relationship between resistant *Streptococcus pneumoniae* (*Spn*) carriage and antibiotic use in rural Alaska. Kenneth Petersen, AIP, is the principal investigator.

A 1992 survey showed that in one rural Alaska region, the prevalence of carriage of penicillin-nonsusceptible Spn (minimum inhibitory concentration [MIC] $\geq 0.1 \,\mu\text{g/ml}$) among children aged 6 years and younger was 29%; however, none of the organisms was fully resistant (MIC $\geq 2.0 \,\mu \text{g/ml}$) to penicillin. In the same region in 1997, antibiotic use was common: 37% of children aged 6 years and younger had received antibiotics in the previous month. New mothers, mainly from rural Alaska, reported that they thought antibiotics should be used to treat colds, flu, and bronchitis, respectively, 35%, 65%, and 95% of the time.

The current study in four regions of Alaska has several components. In the spring of 1998, investigators traveled to the 17 participating villages to collect information on antibiotic use and the carriage of nonsusceptible *Spn.* Approximately 6,000 medical records were reviewed and 2,000 nasopharyngeal swabs were obtained from village residents. Of those carrying *Spn*, 34% had nonsusceptible organisms. In contrast to the 1992 survey, which found no fully resistant organisms, 65% of the organisms were now fully resistant to penicillin.

After this analysis, the four regions were assigned to one of three study arms. In one region, when amoxicillin is administered to children aged 6 years and younger, it is being given at double the usual dose. Data from France suggest that this higher antibiotic dose may decrease the carriage of nonsusceptible *Spn*.

A second region is receiving an intense education intervention. AIP



Cindy Hamlin, AIP research nurse, teaches high school students in Manokotak, Alaska, about antibiotic resistance. Rates of invasive Streptococcus pneumoniae (Spn) disease for Alaska Natives are among the highest in the world. The prevalence of invasive, penicillin-nonsusceptible Spn has been steadily increasing in Alaska, from 2% in 1986 to 13% in 1996.

is coordinating periodic workshops for community health aides and referral physicians concerning judicious antibiotic use for respiratory conditions, with particular emphasis on ear infections. AIP is also conducting educational classes for village high schools and community groups. Additionally, AIP has developed monthly newsletters for village residents that emphasize

appropriate antibiotic use for various medical conditions. The two remaining regions are receiving no intervention and are serving as controls.

This spring, AIP will obtain followup nasopharyngeal cultures from all 17 villages and again survey antibiotic use. Investigators are hopeful that evaluation of these data will suggest a strategy for slowing the emergence and spread of nonsusceptible *Spn*.

NEWS BRIEFS

State lab officials attend Ehrlichia/Bartonella workshop

On February 1-4, 1999, the Viral and Rickettsial Zoonoses Branch, DVRD, conducted a training workshop on the laboratory diagnosis of infections caused by ehrlichiae and bartonellae. Twenty-one state public health laboratorians participated in the workshop, held at the Georgia State Public Health Laboratory in Atlanta. The course covered the clinical and epidemiologic features of ehrlichiosis and *Bartonella*-

associated diseases (e.g., cat-scratch disease), laboratory safety, and the use of modern laboratory methods for the serodiagnosis of these diseases. The workshop, sponsored as part of the CDC strategy for addressing emerging infectious diseases, was designed to assist state public health laboratories in providing the public with timely and accurate laboratory diagnosis and to facilitate surveillance for these diseases.

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Meeting reviews strategies for preventing rubella, influenza A outbreaks on cruise ships

he Division of Quarantine (DQ) hosted a meeting with representatives of the International Council of Cruise Lines (ICCL), medical directors and risk managers from five cruise lines, and two representatives from Health Canada on January 21, 1999, in Atlanta. The meeting was convened at ICCL's request to discuss CDC recommendations for rubella vaccination of crew members of cruise ships and for surveillance, prevention, and control measures regarding shipboard outbreaks of influenza A. This meeting was the first in a planned series that will ensure coordination and facilitate binational efforts to prevent infectious diseases among passengers and crew members of cruise ships.

The rubella vaccination recommendations stemmed from collaborative investigations of two outbreaks of rubella among crew members on Caribbean cruises. These outbreaks raised concerns about potential exposure of susceptible women of childbearing age. Outbreaks of influenza A on 1997 "fall color" cruises in New England and Canada and on 1998 summer cruises in Alaska and the Yukon, during which

elderly passengers who became ill were at increased risk for complications, were also discussed. The Alaska investigation, for which DQ collaborated with the Division of Viral and Rickettsial Diseases (DVRD), Arctic Investigations Program (AIP), Alaska State Health Department, and Health Canada, identified more than 5,000 cases of acute respiratory illness, more than 2,500 cases of influenzalike illness, and 170 cases of pneumonia.

These recent outbreak investigations highlight the potential role of international travel in the rapid dissemination and spread of many infectious diseases and underscore the need to maintain adequate surveillance and response capabilities...

During the meeting, DQ epidemiologists reviewed the data on rubella immunity among crew members and the demographic profile of passengers aboard the

outbreak cruise ships. Data indicated that the majority of crew members were foreign-born and many were from countries without routine childhood or adult vaccination programs; as such, these crew members may represent a susceptible shipboard population that can serve as a reservoir for transmission of infection.

For the influenza outbreaks, DQ and DVRD staff described the passive and active surveillance systems and the interventions recommended to contain transmission of disease, including a) using rapid influenza antigen detection kits on board ship for early diagnosis, b) providing antiviral agents to high-risk travelers, and c) vaccinating ships' crew members and land-based tour company staff.

More than 4.5 million passengers travel on North American cruises annually. These recent outbreak investigations highlight the potential role of international travel in the rapid dissemination and spread of many infectious diseases and underscore the need to maintain adequate surveillance and response capabilities for travel-related emerging or reemerging diseases.

The semiclosed environment of cruise ships provides conditions suitable for the transmission and amplification of various infectious diseases that are spread by personto-person transmission. Ensuring that crew members have received all routinely recommended adult vaccinations for crew members will substantially decrease the potential for future outbreaks of vaccine-preventable illnesses aboard cruise ships.

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Russell Regnery (L), Viral and Rickettsial Zoonoses Branch, consults with Lena Trivedi, public health scientist with the Maryland Department of Health and Mental Hygiene, during DVRD laboratory training workshop.

HIP exhibit produced



The Hospital Infections Program (HIP) has produced a free-standing display about HIP activities to be used at appropriate events and conferences.

News Makers

Award

Brian Mahy, director, DVRD, has been named a fellow with the American Society for Microbiology.

Staff Changes

Vijande Burr has joined OD, NCID, as a senior network engineer.

AIP has recently welcomed several new staff members: Cindy Hamlin, research nurse; Julie Morris, medical technician; Marcella Harker-Jones, medical technologist; Dana Bruden, statistician; and Lisa Chiou, ASPH fellow in health communications.

Michael Patrick has joined DVRD as a computer network engineer.

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